

**Experimental Results of Launching Extraordinary Mode
Microwaves on ECRIS Plasma**

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It has been investigated how to produce multicharged ions efficiently on the tandem-type ECRIS in Osaka Univ.¹ On the 2nd stage of the tandem-type ECRIS, the maximum electron density over cutoff density was observed by Langmuir probe.² Therefore, the microwave propagation and accessibility to resonance regions came to be considered. We can estimate accessibility of microwave with the magnetic flux density and the electron density profile based on the previous experimental results. As a result, it was suggested that the upper hybrid resonance (UHR) heating contributes to enhancement of ion beam intensity.³

Now we are trying to inject higher frequency microwave with extraordinary(X) mode toward UHR region directly. The effect of additive microwave injection will be investigated experimentally in terms of plasma parameters and electron energy distribution function (EEDF) by Langmuir probe and charge state distribution (CSD). In addition, the application of UHR heating to other sources will be also proposed. Moreover, relativistic mass and Doppler shift effect on resonances will be considered in this paper in brief.

References:

1. Y. Kato et al., RSI, 85, 02A950 (2014)
2. K. Yano, et al., RSI, 85, 02A937 1-3 (2014)
3. Y. Kato, et al., ICIS2015, contribution.